

Split-step multi-symplectic method for nonlinear schrödinger equation

Abstract :

Multi-symplectic methods have recently been considered as a generalization of symplectic ODE methods to the case of Hamiltonian PDEs. The symplectic of Hamiltonian systems is well known, but for Partial Differential Equation (PDEs) this is a global property. In addition, many PDEs can be written as Multisymplectic systems, in which each independent variable has a distinct symplectic structure. Also, Their excellent long time behavior for a variety of Hamiltonian wave equations has been proposed in a number of numerical studies. In the study, a new type of multi-symplectic integrators, which is used for solving Nonlinear Schrödinger Equation (NLS) has been demonstrated.